

## Clinical Section

### Surgical Collapse of Pulmonary Tuberculosis\*

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Medical science is advancing on many fronts, and well in advance is thoracic surgery, a branch of surgery little known or even heard of fifteen years ago. Today it is leading the field of surgical specialties.

I will only touch on one sphere of this branch of surgery, that is the surgery of pulmonary tuberculosis.

I intend to briefly outline the procedures used at the present time.

*Pneumothorax* is included under the heading of surgical collapse of the lung. But I will not deal with this subject except to say it is one of the most important therapeutic measures in combating pulmonary tuberculosis today.

#### Intrapleural Pneumonolysis

Associated with the pneumothorax treatment is the cutting of pleural adhesions, known as *intrapleural pneumonolysis*. As you are aware, very few people with pulmonary tuberculosis have their parietal and visceral pleural layers free from adhesions. Some fortunately have slight adhesions and these stretch gradually as the air is repeatedly introduced into the pleural space, thus not interfering with the treatment. A second group have more and larger adhesions, and although they may stretch, yet they prevent effective collapse because they overlie the diseased part of the lung, especially where cavitation is present. Again there are massive adhesions resulting in obliteration of the intrapleural space, making pneumothorax impossible. It is the second group we are mainly concerned with in regard to surgically severing these adhesions. Cutting is done with the galvanic current, that is, the hot cautery or the high frequency current, or cold cautery method. In practically every case the operation is done with instruments introduced between the ribs but under the vision of an endoscopic instrument known as the thoracoscope. Rarely the chest needs to be opened and adhesions severed under direct vision. This is only called for where adhesions are too large or vascular to safely sever by the closed method, especially where a pneumothorax is the only treatment available.

#### Phrenic Nerve Interruption

Passing on to another form included under surgical collapse is the *phrenic nerve interruption*

by means of which paralysis of half of the diaphragm is obtained. This can be done as a temporary procedure by crushing the nerve, or as a permanent measure by avulsion of the nerve. Experience has limited the indications for this procedure so that it is used much less frequently now than formerly.

- (1) It is used in conjunction with pneumothorax where basal adhesions are present, that is adhesions of lung to diaphragm.
- (2) Where pneumothorax fails and disease is slight. Especially is the operation called for in mid-lung or basal lesions.
- (3) Where contra-lateral disease contraindicates more severe forms of collapse therapy.

It is made permanent mainly in basal lesions or in people too old for thoracoplasty. It is *not* used as formerly, preliminary to thoracoplasty.

#### Thoracoplasty

The third and main topic of my discussion is the surgical collapse of the lung by removal of portions of ribs on the involved side—known as thoracoplasty. It is by no means a new treatment. It was suggested first as early as 1885 but not used to any degree until the early years of the 20th century on the continent by Brauer, Freidrich, and later by Wilms and Sauerbruch. In America Dr. Edward Archibald performed the first thoracoplasty in 1912. In Manitoba the first operation was performed in 1922 by Dr. Mann. The early operations were performed on very chronic, often hopeless cases and the results, as would only be expected, were often discouraging. The choice of cases has only changed radically in the past three or four years.

Nissen, a well-known surgeon and authority on tuberculosis in Germany, stated five years ago “Without operation, out of 100 patients with caseous pneumonic tuberculosis in which pneumothorax was not effective, 50% died within a year, 30% more within two years, 10% more within 3 years and only 10% survived over four years.” (Nissen).

Out of 100 similar patients submitted to thoracoplasty 50 were completely cured; that is, within one to two years after operation they were able to perform a full day's work and were permanently free of bacilli. Twenty more were alive and greatly improved ten years after operation, and bacilli free for the most part. Fifteen to twenty died following operation and in ten the operation did not influence the course of the disease. In other words, of 100 patients doomed without thoracoplasty to certain death, obliged in the meantime to spend their life in sanatorium, and constituting a real danger for the community, 60

\* Paper read before the Brandon and District Medical Society, October, 1937.

to 70 were able to return to active life and become an asset instead of a liability to society."

At present the ideal case has unilateral caseous pneumonic tuberculosis whether chronic, subacute or even acute, where pneumothorax has failed or proved unsuccessful. Bilateral disease, however, is not a contra-indication and we now operate on people with bilateral disease, providing the disease in the better lung is not too advanced, and retrogressive, or at least stationary for three to six months. In some instances disease in the contralateral lung is under control by means of pneumothorax, unless, of course, bilateral thoracoplasty is contemplated.

Tuberculous empyemata—which persists and do not respond to conservative measures over a period of time — constitute a third group for thoracoplasty.

Finally, the last group are those with mixed infection empyemata. These, of course, are very ill, toxic patients. The empyema is drained by tube prior to operation and often removal of the roof of the empyema space is required as well as the overlying ribs before final cure is effected.

Before dealing more fully with this subject I would like to mention another form of surgical collapse, *paraffin pack*, where an extrapleural space is made artificially and a substance, usually paraffin, is used as a pack to retain the collapse permanently.

There are many modifications of this procedure, but the one commonly used is the one cited above, using paraffin wax of special melting point. This is only indicated in cases with limited apical lesions where cavitation is small and not peripheral and where contralateral disease or age contraindicates thoracoplasty.

### Technique of Thoracoplasty

Referring back to thoracoplasty I will briefly mention the technical changes in this procedure over the past few years.

At first the idea was to remove a small segment of each rib posteriorly, from the first rib to 11th rib inclusive. This was performed at one operation, and even with small segments removed the mortality was very high. This was modified by Sauerbruch and slightly longer lengths were removed posteriorly, including the angles of the ribs. Gradually after several years it was realized that doing the same operation in two stages was much safer and less liable to result in a mortality, but even with this change the number of people who died after operation was still too great to allow the procedure to gain popularity.

Not until about 1932 did several American surgeons advocate doing the rib removal in smaller stages and removing greater lengths of rib. Doing less at each stage meant, of course, three or four operations for some, but it reduced the mortality rates remarkably. In some centres the early operative mortality rate is as low as 4 to 5%. This is a very creditable showing. One must not

lose sight of the fact that the subjects for operation are usually quite sick, and a good many have been ailing for many years, thus having a serious drain placed on all their vital organs, and especially on the cardiovascular system.

Another change was the realization that a limited number of ribs removed at the top would suffice for apical lesions, thus developed partial thoracoplasty, and today it is only rarely that more than 8 ribs are removed even for gross apical lesions, except where disease is also basal or where an empyema space is to be obliterated.

We here at the first operation try to remove all the first and second ribs to the costal cartilages in front and posteriorly to and including part of the transverse process. In some people who are very ill or in poor condition the removal of two ribs is all that is attempted at the initial operation.

Usually the third rib or at least the posterior part of the third rib is removed at this first operation. More rarely 4 ribs are excised at the first stage. At subsequent stages, 4 to 5 ribs more are removed, depending on the need. Lengths of rib removed vary according to size of individual being anywhere from 8 to 11 inches. Where cavities are very large, often the anterior ends of the ribs are removed at a separate operation called anterior thoracoplasty. The costal cartilages are not usually excised, but partially disarticulated at the sternum to allow them to be compressed inwards.

A recent modification introduced in Sweden and on the continent, and only recently used in this country, is that of apicectomy combined with thoracoplasty. After 2½ or 3 ribs are removed the intercostal bundles are cut and tied posteriorly and the whole apex of the lung is separated from its bony attachments and allowed to drop down sometimes even 3". This modification insures a much better collapse, as the collapse is not only inwards but downwards as well.

The separate operations or stages are performed usually three to four weeks apart. All operations here are done under local anaesthesia, using  $\frac{1}{2}$  of 1% novocaine. The infiltration is made in 3 layers, 1st the skin in line of incision, 2nd the muscles in the incision, and 3rd intercostally below the ribs to be excised. This anaesthesia takes more time.

The anaesthesia is a very important factor. The advantages of local over any type of inhalation anaesthesia is, *first*, the lessening of pulmonary complications, such as post-operative atelectasis and pneumonia, and tuberculous spreads. *Second*, the almost complete eradication of operative shock through care in handling the tissues, preventing undue or unnecessary bleeding, and stopping the operation temporarily at the first signs of blood pressure drop. We practically never finish an operation where the systolic blood pressure is not over 100 m. This is almost unheard of with any other type of anaesthesia.

The post-operative care of these patients is extremely important. One detail that may mean

the difference between success or failure is the prevention of bronchial obstruction, resulting in atelectasis, and if unrecognized, in pneumonia. It is easy for thick sputum to act as a plug. Patients after operation, with considerable pain, try not to cough and so aggravate this tendency to blockage. We try to prevent this occurrence, first by urging the patient to cough and raise sputum when any is felt, and second, by inhalation of CO<sub>2</sub> and O<sub>2</sub>, thus stimulating deeper respirations and cough.

Following the completion of the operations a special brace is fitted to retain the collapse until the ribs regenerate.

### Results of Thoracoplasty

I would like to mention that to date, since April, 1935, at the Manitoba Sanatorium, 110 people have had thoracoplasties or paraffin packs; only eight of the latter have been done to date. On these 110 a total of 320 operations have been necessary, with only 3 operative deaths. That is slightly less than 1% of the total number of operations, or 2.7% of the individuals.

Of those completed, 75% have excellent clinical results with persistently negative sputum, which is even better than the 50% quoted in Nissen's figures.

Another 15% are clinically much improved but still have occasional positive sputum. In other words, 90% are greatly improved by the operation. About a third of the cases operated upon since 1935, that is in three years, have been discharged well to their homes to carry on in some cases for a further period of cure at home, and gradually resume their activities and occupations.

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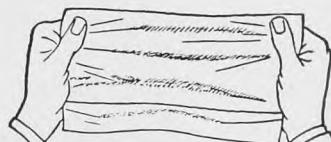
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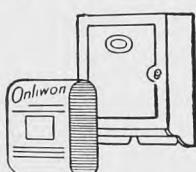
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### Notes on Epidemics of the Past\*

*By*

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My year as President of the Winnipeg Medical Society has drawn to a close and I wish to thank you most sincerely for the honour you have reposed in me. I wish to thank the executive who so generously assisted me, and also those who contributed to the programmes. I want to take advantage of this occasion to admonish the younger members of the Society to see to it that they pull their weight in the matter of contributions to the Society.

As the year rolled on and this present duty of delivering a Presidential Address became more inescapable and, at the same time, more oppressive, it seemed increasingly difficult to choose a subject. The constitution stipulates that it shall be one on the medical subject. Various phases of our economic welfare have proven interesting subjects of discourse when propounded by certain of my predecessors, and you have been addressed on ethical problems, no doubt to your advantage. One difficulty encountered was that of adhering to a subject once chosen. The original subject revealed

another which seemed more appropriate but which, in turn, proved too vast to be suitable. In the end, only certain important points have been selected to make up this presentation, and I would deliver it to you under the title "Notes on Epidemics of the Past."

Supposing that our present enlightened knowledge of the control of infectious diseases had existed for the past three thousand years, what would this world be like? What would the population of the world be, and where would be the centres of concentration? With a birth rate of 30 (and this would be a very moderate rate in early times) and a death rate of 15 (which is our present favorable mortality), the population would double easily in less than 50 years, and if this enormous multiplication persisted through the ages, deaths would undoubtedly increase as a consequence of more and greater wars and famines.

It is quite apart from this discussion to comment on the falling birth rate encountered throughout the world, but it would seem to be the only solution to meet the emergency of over-population.

Considering this new world, it defeats one to find a single logical argument in favor of an ever increasing population. The population of England has trebled since the early 19th century. Why cannot England and all other countries similarly situated go back to half their present population? Perhaps then, there would be room and employment for all under our present mode of life.

Disease has played an incalculable role in the history of the world. If those enormous epidemics of the past had not occurred, try to imagine what race—white, yellow, or black—would predominate; where the centres of culture and civilization would be; what trade and commerce routes would exist; what forms of worship there would be. There have been occurrences of epidemic disease in history which have moulded the future development of nations and continents.

#### EFFECTS OF DISEASE ON HISTORY

The Peloponessian War was waged for 30 years between Athens and Sparta. It started in 430 B.C. Athens was populous and distinctly the leader throughout the world in culture and civilization. It is called in history the Golden Age. Pericles was the leader and lawmaker. There were other great Athenians—Hippocrates, a practising physician whom we respect in all ways. The philosophers were Socrates, Plato, and Anaxagorus. In literature, Aeschylus, Sophocles and Euripides remain immortal. In architecture, Phidias and Polygnotus are unrivalled and the object of the undying admiration of their successors to the present time. These are a few of the intellectual giants of Greece during this period, and it must not be supposed that they stood out as accidental giants amongst a population of low

\* Address of the Retiring President of the Winnipeg Medical Society, delivered at the Annual Meeting of the Society May 19th, 1938.

mentality. There is good proof that the whole race was a very superior one. Galton, the great English scientist, wrote: "The average ability of the Athenian race was on the lowest possible estimate, two grades higher than our own; that is, about as much as our race is above that of the African negro." Such a statement should not go unchallenged. One might accept this unfavourable comparison from one, let us say, who lived before the 19th century. But Galton lived from 1822 to 1911, and had an opportunity to appraise our scientific advancement — electricity, steam, aircraft, telephone, telegraph and wireless, medicine and surgery. He must have had a deep reverence for the arts and letters of the Greeks to warrant this derogatory comparison.

In the course of this war a pestilence broke out in Athens. Their attacking foe, the Spartans, fled to escape it and the Athenians pursued them in the hope that they might shake off its devastations. The army was annihilated—not by the foe, but by the plague. So was their proud navy. Pericles, their leader, and all those famous individuals of history with a high percentage of the population died, and from that day Athens subsided into mediocrity. History attributed the decline of Athens to the Peloponnesian War. It is reasonable to suppose that if this plague had not intervened, warlike and intellectual Athens would have emerged superior from this combat.

Try to consider the change in the world's history from this event.

Thucydides, another immortal Athenian, wrote as an eye witness of its ravages. It is said that his is the only story of this epidemic, but his description does not recall accurately Bubonic Plague, though some medical historians have accepted it as such. His account reads: "reddish, livid, marked all over with little pustules and sores." This puts one in mind of small pox. This disease, however, was unreported for centuries to come as responsible for large epidemics.

Napoleon had subdued most of continental Europe when he took his army 500,000 strong into Russia to complete its conquest. After a winter of campaigning, he retired to France with a broken remnant numbering about 25,000. He is quoted as having said General January defeated him, but his largest casualties resulted from epidemic diseases of which typhus was the most serious. That was the beginning of Napoleon's downfall. The end result of Napoleon's career to France was to depopulate the country and remove two inches from the stature of the Frenchman.

King Henry VIII. of England reigned when Lues Venera or the Great Pock or the French Pock as it was variably called, had lighted up as a great plague. There is fairly reliable evidence that Henry VIII. suffered from this affliction. He demanded a male heir and beheaded one wife after another until the Pope disallowed further marriages. Thereupon Henry appointed himself head of the Church and the Church of England

was born. History reveals that the people were in agreement, for the most part, with this change, for the priests, friars and monks of the time had lost the respect and confidence of the people and were living a most debauched and lecherous life.

Almost contemporary with the Greek civilization there existed a culture in China. It must have been very advanced too. It has been stated that the Greeks and Chinese were ignorant of each other's existence; even in the 13th century Marco Polo found the Chinese in ignorance of the outside world. The reason for the decline of the Chinese is not clear, but the ravages of the plague in the latter part of the Middle Ages is indisputable history and, no doubt, played a major part in the decline of China.

The Mayas of Yucatan had reached an advanced state of civilization up to the year 600 A.D., and their dissolution was rapid, due, history tells us, to the ravages of yellow fever.

These are only a few of the major events in history where disease has played the predominant role and deflected the course of the human race.

The epidemic diseases which have made history are several: plague, typhus, dysentery, syphilis, yellow fever, malaria, influenza, small pox, tuberculosis. Of these, plague has been the most important, certainly the most spectacular.

It is interesting that malaria is the greatest of all, in the opinion of Sir William Osler. He points out that it is continuously present in a band encircling the earth 3,000 miles north and south of the equator, continually ravaging the people, throughout the ages, killing myriads and debilitating even more.

#### THE PLAGUE

It is denied that the Athenian plague described by Thucydides was one of the Bubonic type. The first historical notice of this infection is written by the physician, Rufus, of Ephesus, who fully described the buboes encountered in an epidemic in Lybia about 300 B.C. It is not until 600 A.D. that the plague is reported in Europe in the reign of Justinian. It can be said to have reigned too for a period of 50 years. It spread over the whole Roman world beginning in Maritime towns and spreading inland. In the 7th century there are reports of pestilences in England chronicled by a priest, Bede, which were probably Bubonic plague.

In the 14th century great cycles of epidemics swept back and forth over Europe. In England the devastations of the plague were greatest in 1349. This was the Black Death, so called from the petechial haemorrhages which at death turned the body black. Other clinical features of this severe form were the haemorrhages intestinal and pulmonary, and the pneumonic form of the disease. Probably no disease in the history of mankind had such a high mortality. The Black Death was introduced from the East, even from distant China, it is stated. Old Chinese records confirm

the existence of widespread pestilences in the period which destroyed thirteen millions of the population.

In Europe it is estimated that two-thirds to three-fourths of the population of various parts died. Some countries were less severely affected. Historians estimate the loss of twenty-five millions in Europe in the epidemics of this century. In the 15th and 16th centuries epidemics continued, but not pandemics like the Black Plague. In 1427, 80,000 died in Dantzig; in 1466, 40,000 died in Paris; in 1570, 200,000 died in Moscow; in 1572, 50,000 died at Lyons, and so on. Literature is replete with such records. Outbreaks occurred during these centuries in the British Isles. The 17th century was better for all of Europe except England. How the rest of the world was faring one can only surmise. No year for England was entirely free. Three great epidemics occurred in England in the 17th century: 1603, 1625 and 1665; the last being the year of the Great London Plague. The mortality of these three epidemics was roughly the same, about one-fifth of the population.

TABLE OF DEATHS FOR LONDON

Year	Population	Total Deaths	Plague Deaths	Highest Mort. in		Worst Week
				1 Week	Worst Week	
1603	250,000	42,940	33,347	3,385	Aug. 25-Sept. 1	
1625	320,000	63,001	41,313	5,205	Aug. 11-18	
1665	460,000	97,306	68,596	8,297	Sep. 12-19	

The mortality from the Plague in London in 1349—the year of the Black Death—is not ascertainable, but estimates vary from 50% to 90% of the population, or in numbers from 20 to 100,000. The accepted figures are 30,000 or 50% of the population.

In 1665, 75,000 - 80,000 died by plague out of a population of 460,000, but it is recorded that two-thirds of this population had fled and one does not know how many of these succumbed. After this year plague died out in London. The London fire occurred in 1666 and the disappearance of the plague was attributed to this, but no such cause existed in other cities where they became equally free. Quarantine Laws have been credited with its control, but there was no quarantine in England until 1720. It just stopped, that's all, so far as the British Isles were concerned. But epidemics of varying degree continued throughout Europe until the last one recorded in 1878-79 on the banks of the Volga. The plague finally burned itself out, throughout the world. Zinsser says it is one of the great mysteries of epidemiology.

The accounts in Pepys diary of the London Plague are worth reading. Better still are the "Notes of the Plague Epidemic" by Daniel Defoe, who was a small boy at the time, and writes from his own memory, from the works of contemporary writers, and the description of his elders.

The aetiology of Plague to us today is quite apparent, but up to the time Kitasato, a Japanese working during the last epidemic in the far east in 1893, discovered the Bacillus Pestis and proved

it was responsible for Bubonic Plague, the world including the medical profession were like a ship without a compass in their opinions as to its cause. Latterly, it was being recognized that its behavior was very much like illnesses produced by bacteria, and this was commented upon repeatedly, but men still talked about miasmata, which means infectious or noxious emanations. A theory almost universally accepted was that it resulted from the mode of burial, the too superficial burial, or burial in tombs invaded by water and in the hot sun resulting in rapid putrefaction, and the presence of "cadaveric poison." Later, one could follow their observations on its transference from one country to another by overland and sea routes: its arrival in port, its spread inland, its spread in a city. But the fundamental cause still remained a mystery. I consulted an old edition of the British Encyclopaedia, 1894, and these efforts to explain the plague were made very plain therein. The article mentioned the death of the rats and other rodents in a community before the onslaught of the plague on its human victims. This was repeatedly observed in India and China. It was observed in England in Queen Elizabeth's time, but then they destroyed the dogs and cats instead of the rats. It was most interesting to read this account in the Encyclopaedia written in the same year that Kitasato discovered the Bacillus Pestis and irrefutably incriminated the rats and fleas.

I believe it is occasionally held that Scotland did not suffer from the plague which invaded England from time to time. This is not true. No part of the British Isles was free from its ravages. The register of Aberdeen contains this entry: "It has pleased the goodness of God of His infinite mercy to withhold the said Plague frae this Burgh this fifty-five year begane," and this immunity may have been due to the following Draconian ordinance dated May, 1585, erecting three gibbets "ane at the Mercat Cross, ane other at the brig of Dee, and the third at the haven mouth, that in case any infectit person arrive or repair by sea or land to this burgh, or in case any indweller of this burgh receive, house, or harbour, or give meat or drink to the infectit person or persons, the man be hangit, and the woman drownit." The fact that they erected gallows suggests that they meant business.

Another incident of the plague worthy of recounting relates to the attempt at isolation of a little village in Bavaria, Oberammergau. For two years they posted armed guards on the roads into their village and succeeded in avoiding the plague. Then one night a workman stole into the village to visit his wife and child, and while at home was taken ill and died. Immediately there was panic, and the inhabitants tried to escape, but the City Fathers forbade any exodus from the village. The plague, once started, raged amongst them and the City Fathers met in prayer and supplication and vowed that if this punishment should be lifted they would re-enact the "Christus Drama" or Passion Play every ten

years in perpetuity. This they have observed except during the war when its renewal had to be post-poned until 1922.

Another item of interest was the origin of the famous drinking song "Ach du Lieber Augustine." It was during a night of carousal that the musician Augustine made this music and staggering homeward later, singing his new song, lost his way and went to sleep in the roadway. Here he was discovered and, believed dead, was cast on a heap of plague corpses awaiting burial. He woke, fortunately, before interment.

There is this to be gathered in all this early reading—the even invasion of the population. The wealthy and well-born were as subject to its attack as the common people. This was so in the earlier visitations; not so in the later epidemics when it was regularly noticed that the greatest incidence occurred among the poor whose squalid living conditions were conducive to the spread of such an epidemic, for their sanitary conditions must have been indescribably filthy. Comparatively few of the upper classes died in the epidemic of 1665.

#### THE ENGLISH SWEATE

To devote further space to the plague would be at the expense of equally interesting diseases. One of these was the English Sweate. There were five epidemics of this disease in England starting in the autumn of 1485 and recurring in 1508, 1517, 1528 and 1551. In 1529, after the fourth sweate, it invaded the continent and later became endemic in Picardy, but a remarkable feature about it was its failure to spread great distances, that is, in France it remained local to Normandy and Picardy and a small part of France in the north. It did spread, however, across Germany and Poland. In 1485, its appearance coincided with the defeat of Richard III. by Henry VII. at Bosworth Field, and Henry's triumphant entry into London.

Here was an epidemic unlike the plague, which did not distinguish between high and low, rich and poor. So many of the court and Henry's personal attendants caught the infection that the King did a great deal of travelling in the epidemic of 1508 in his attempts to give it the slip. The fourth invasion was in 1528 when Henry VIII. was on the throne and had become enamoured of Anne Bolyn, but his advances were interrupted by the fact that one of her maids had been attacked by the epidemic disease. Anne and her father caught the disease but recovered. Henry sent them his own physician. Du Bellay, a French envoy wrote an account of the "Sweate." He says he saw people "as thick as flies rushing from the streets or shops into their houses to take the sweate whenever they felt ill. In London, I assure you, the priests have a better time than the doctors except that the latter do not help to bury. If this thing goes on, corn will be cheap. It is eleven years since there was such a visitation, when there died 10,000 persons in 10 or 12 days; but it was not so bad as this has been." Writing 12

days later he says that some "40,000 were attacked in London, only 2,000 died."

In the 5th epidemic the deaths in London were something under 1,000. This is at great variance with some historians who record colossal losses, especially in villages, towns and communities. Zinsser, writing on it, quotes two German historians "Haeser" and "Hecker" that one-third to one-half the population of certain towns were wiped out and occasionally the mortality reached 80% to 90%.

It is true, undoubtedly, that the "Sweate" struck suddenly, often killed quickly, raged violently for a few days or weeks and the morbidity was tremendous, but Creighton seems to have delved out the true facts as to losses. The population were undoubtedly panicky as they were in the influenza pandemic of our memory, and there is reason to believe that "many took the sweate" as du Bellay described it, out of pure jitters.

The English Sweate resembles no known infectious disease unless it be influenza without catarrhal and pulmonary complications—influenza as it first appeared in the spring of 1918—so called Spanish influenza in a very virulent form.

The clinical descriptions are very meagre and unreliable. The onset was sudden and death could occur in four to twelve hours. High fever, tremors, profuse sweating, and an intolerable thirst, occasional vomiting, headaches, stupor, but rarely delirium was all one can gather, without deep study, from the records. The theories of the time as to its aetiology were about as crazy as you would expect—the heavenly bodies, the air, the poisons emanating from the earth.

#### TYPHUS

Hanz Zinsser has made a careful study of the Epidemion, the clinical studies of Hippocrates. Many of these descriptions are so accurate that more exact diagnoses can be deduced from them now than the ones made in his time. Zinsser identifies many diseases in his search for evidence of typhus in Greek history. He identifies an epidemic of pink eye, probably cases of bacillary dysentery, undoubted cases of malaria; an epidemic of mumps; cases that might have been typhoid, others of Malta fever, possibly scarlet fever or diphtheria, an unquestionable case of puerperal sepsis, probable cases of streptococcal infection, poliomyelitis, acute appendicitis, but no typhus. He cannot identify the plague of Athens, but says we have to choose between typhus, bubonic or pneumonic plague and small pox—probably the last. In his search for evidence of the earliest epidemic of typhus, he records very many devastating epidemics through the middle ages and ridicules all the famous military leaders of this period and asserts that plagues of one sort or another decided practically every campaign of these centuries.

Typhus is first recognized in 1528 and Zinsser follows its influence from then, through most wars until the recent Russian revolution.

It was not confined to the army, but the civilian population suffered from its ravages also. It was known in England as "jail fever," "ship fever," "famine fever" and "spotted fever." Now typhus is known to be caused by the louse, but for centuries the cause was a mystery. Everyone has heard of the Black Assizes of Cambridge and Oxford and Exeter. These are really very interesting and even amusing to us today, for we can understand what happened. At Cambridge, the miserable prisoners were brought out of their dungeons into the light of day and sat in rows before the court. The judges and officers of the court, being in closest proximity to the wretches were the first to be invaded by the disturbed lice who immediately migrated from their ragged hosts. These officials were immediately infected and very soon many died. Those in the court who had not seats of advantage, the ones in the back seats so to speak, were not affected. It was taken for granted that the illness was produced by the stench that arose from the prisoners. Almost exactly, this calamity was re-enacted at Oxford and Exeter in the years 1577 and 1583.

Charles Nicolle, working in the Pasteur Institute in Tunis, solved the mystery of typhus. He read his sensational results before the Academy of Sciences at Paris in 1909. It is to him Hans Zinsser has dedicated his book "Rats, Lice and History."

#### SMALL POX

Where small pox originated is shrouded in obscurity; when it first made its appearance is likewise unknown. The first description of an epidemic which is now believed to have been small pox was in Rome, in 79 A.D. when there occurred an epidemic whose virulence resembled the plague. It raged for fifteen years, and, as if the unfortunate Romans had not enough to put up with, with their wars and this pestilence, there occurred earthquakes and a frightful eruption of old Vesuvius. This epidemic waged from Persia to the Rhine.

The first description of the disease was by an Arabian with the very much abbreviated name of Rhazes. In the 10th century the "dark ages" for Europe, Bagdad was a great centre of learning and culture and this Rhazes who described small pox, differentiated it from measles. With great versatility he wrote upwards of two hundred books on medicine, mathematics, chemistry, physics, astronomy and philosophy.

Small pox crept over the face of the globe, probably from the east — India or Africa. In England it was called simply the "Pock," meaning a skin eruption, but in the 16th century it had to be differentiated from syphilis which became known as the "great pox" and so the other disease was then called the "small pox."

The history of small pox in Great Britain and Europe is that of a disease coming gradually into prominence and hardly attaining a leading position until the reign of James I. or about 1600. In this respect it is unlike the plague or the sweating

disease, both of which burst out in their full strength in the first epidemic. In the Tudor reigns and before, small pox and measles were regarded as a combination of the same disease, but as the 17th century progressed small pox was regarded as more formidable as proven by the London Bills of Mortality. This is confirmed in an essay by a physician, Dr. Tobias Whitaker, who attended Charles II. court in its exile and noted the increased virulence of the disease when he returned. He comments "this disease was antiently and generally in the common place of 'petit' and 'puerile,' and the cure of no moment—but from what present constitution of the ayre this childish disease hath received such pestilential tinctures I know not." By the way, in the same essay, he says of his "most learned predecessor" at Court, Harvey, that his demonstration of the circular motion of the blood was a "further extension of what none were ignorant of though not expert in the dissection of living bodies." I inferred that this was an early example of professional jealousy.

The history of the discovery of the method of preventing small pox by vaccination is so well known to you that I will not repeat it.

Of all countries which have made use of vaccination, Germany heads the list. During the Franco-Prussian War, Germany lost 297 men from small pox and France lost 23,400. In England, with a population of 16,000,000, as late as 1840 there were over 40,000 deaths from this disease alone. The morbidity figures were hard to determine, but, presuming it averaged 10%, that would mean 400,000 cases in England in that year which was not vastly different from every year.

#### OTHER EPIDEMIC DISEASES

A continuance of this description of the sad plight of our forebears would be never-ending.

One is amazed at the great death toll of infectious diseases. These plagues I have mentioned are only incidental to the havoc caused by infections en masse. Whilst one form lighted up in a huge blaze it would seem all others would flare up to some extent at the same time. After mortality rates were kept one can roughly ascertain their enormity and by comparison, with the birth-rate, it brings one back to the original reflection—how did the human race survive?

Time does not permit any investigation into the history of many unmentioned diseases of by-gone days. Some of them, besides those mentioned, are by-gone, too. Leprosy has disappeared in Europe. One is surprised to find that in France in mediaeval times there were two thousand Lazar houses for the isolation of these afflicted. In England there were several hundred. This may sound like very large numbers, but it should be explained that they were small houses of refuge. Further, one cannot escape the impression that leprosy was a widely inclusive term. Certainly syphilis, before its outburst into epidemic proportions in the late 15th century, was generally included in this classification.

Leprosy is a disease of the past. Syphilis is more prevalent now than ever. It has been stated that the United States is rapidly becoming "syphilitized." There is no opportunity here, however, for any bright young scientist to discover a means of stamping it out as in the case of some of these other diseases. Its control is the burden of the combined forces of the state and the medical profession.

Any of the remainder of the unmentioned diseases—*influenza*, yellow fever, cholera, dysentery, typhoid, diphtheria, scarlet fever, measles, whooping cough and infantile diarrhoea would, from a historical point of view alone, prove a sufficiently large subject for an address.

#### SCURVY

There is one last disease of which mention might be made, namely, scurvy. This disease often ravaged armies especially when they were faced with famine, and famines and plagues were often coincident. McKinnon, a most energetic historian, sifting all records of the first seventeen centuries of the Christian Era found that there has been a famine somewhere in the world every seven and one-half years and a pestilence every four and one-half years.

But it is on long sea voyages that scurvy became a grave menace to mankind. After Columbus, adventurous explorers set sail for the great unknown. Magellan was one of these—probably the greatest in history, next to Marco Polo, according to the biographer, Stephen Zweig. His difficulties were rendered almost insurmountable by scurvy. Jacques Cartier, on his first voyage to Canada, made a very expeditious passage and suffered no illness among his crew. The second voyage the following year, 1535, was with three ships of about sixty tons each. They wintered on the coast in heavy ice, and about midwinter began to suffer from scurvy, to them a hitherto unknown disease, which they attributed to the Indains. The following is an interesting account by some member of the expedition, presumably the doctor, and in part descriptive of scurvy as encountered then.

"The said unknown sickness began to spread itself amongst us after the strangest sort that ever was either heard of or seen, insomuch as some did lose all their strength, and could not stand on their feet; then did their legs swell, their sinewes shrink as black as any coal. Others also had their skins spotted with spots of blood of a purple colour; then did it ascend to their ankles, knees, thighs, shoulders, arms, and neck; their mouth became stinking, their gums so rotten that all the flesh did fall off even to the roots of the teeth, which did also almost fall out. With such infection did this sickness spread itself in our three ships that about the middle of February, of a hundred and ten persons that we were, there were not ten whole; so that one could not help the other. There were already eight dead and more than 50 sick, and, as we thought, past all recovery." The body of one dead, aged 22, was opened

to see what the disease was; he was found to have his heart white, but rotten, and more than a quart of red water about it; his liver was indifferent fair; but his lungs black and mortified . . . his milt (spleen in mammals) towards the back was somewhat perished, wrought as if it had been rubbed against a stone.

"From the midst of November to the midst of March there died 25 of our best and chiefest men, and all the rest sick except three or four; then it pleased God to cast his pitiful eye upon us, and sent us the knowledge of remedie of our healths, and recovery. The captain, walking upon the ice, asked of Domagaia (an Indian) how he had done to heal himself; he answered that he had taken the juice and sap of the leaves of a certain tree, and therewith had healed himself, for it was a singular remedy against that disease." The Indian's advice was "to take the bark and leaves and boil them together and to drink of the said decoction every other day, and to put the dregs of it upon the legs that were sick."

"It is thought to be the sassafras tree. After this medicine was found and proved to be true there was such strife about it, who should be the first to take of it, that they were ready to kill one another, so that a tree as big as any oak in France was spoiled and lopped bare, and occupied all in five or six days, and it wrought so well that if all the physicians of Montpelier and Lovaine had been there with all the drugs of Alexandria, they would not have done so much in one year as the tree did in six days, for it did so prevail that as many as used of it, by the grace of God, recovered their health."

In 1542 the earliest French inhabitants in Lower Canada suffered severely from scurvy during their first winter.

The first English records of scurvy were those of Sir Richard Hawkins, who, in 1593, wrote: "And I wish that some learned men would write of it, for it is the plague of the sea and the spoil of mariners. In twenty years since I have used the sea, I dare take upon me to give account of ten thousand men consumed of this disease. That which I have seen most fruitful for this sickness is sour oranges and lemons and a water called Dr. Stevens, his water, of which I carried but little, and it took end quickly but gave health to those that used it."

Contemporary mariners from then on were vaguely aware of the deficiencies of the diet on these protracted voyages and were familiar with the rapid cure wrought by fresh fruits—lemons, limes, and oranges as well as fresh herbs and grasses and vegetables. Scurvy continued to menace them and it remained for John Woodhall, surgeon to St. Bartholomew's Hospital and surgeon-general to the East India Company to prove himself the "learned" man of Sir Richard Hawkins' desire and write of the cure of scurvy in the "Surgeon's Mate" published in 1617. This practical manual dealt with fractures, amputations, dislocations, and the like, as well as illnesses

such as "fluxes of the belly, of the colica and iliaca passio, tenasmus" and kindred subjects. One chapter is devoted to scurvy and he simply relates the experiences of old navigators and urges the use of fruits and points out the extra-ordinary rapid curative effect of these.

The East India Company was formed in the year 1600 with a capitalization of £72,000. The first passages were hazardous and prolonged and the mortality from scurvy alone was high. In 1628 we read of the return of the William to England "without a sick man on her, nor any dead on the way; her lading was computed to be worth £170,000."

Intimate knowledge of the settlement of Virginia by Sir Walter Raleigh reveals all the horrors of the passage by sea from scurvy and infection and the vicissitudes of the early settlers from pestilences after their arrival. Likewise for the more northerly colonies of England and France.

The pestilences that beset the population on land were encountered in greater measure on the sea, due, it may be presumed, to the confined quarters. The mortality in the African Slave Traffic is something appalling. We have always taken for granted that the destruction of the Spanish Armada, 1588, was a British naval achievement almost without equal in history. The facts are that storms parted the two fleets at the mouth of the Thames and drove the Spanish fleet as far as the Orkneys. "The English ships which had come to anchor in Margate Roads were utterly crippled by sickness, but in the Spanish ships, beating about on the high seas and unable to land their men or help each other, the sickness grew into true plague, so that the broken remnants of the Armada which reached Corunna were like so many floating pest-houses."

#### CONCLUSION

The preparation and writing of such a paper as this should enable one to draw some conclusions or point some moral. In this case I am afraid not, the most it has done is imbue me with certain thoughts; the remarkable fact that the race has survived; with Hans Zinsser, some contempt for the great military heroes of the past; the greatest respect for medicine which has wrought such changes; the menace of epidemics in the future, and the appearance of new disease to replace old ones which have "burned out"; the low birth-rate which is the present day "brake" on a rapidly increasing population — Otherwise, only war is left to decimate the race. In the distant past this was a slow and futile way, but modern warfare is infinitely more effectual and perhaps the destruction of mankind could be hastened in time of war by unleashing once again the destructive forces of disease. Perhaps in the next war this will be attempted and some brilliant medical research worker will bring himself undying fame in his own country for his Machiavellian enterprise. I am afraid his name in Christian countries would be offensive.

## NEWS and NOTES

The Annual Meeting of the Brandon and District Medical Association was held in Brandon on May 12, 1938, and the following officers were elected:—

President, Dr. George Little, Brandon.

Representative to Manitoba Medical Association, Dr. J. R. Martin, Neepawa.

Secretary-Treasurer, Dr. G. J. Creasy, Brandon.

A paper was read by Dr. P. H. Thorlakson of Winnipeg on "Gastric Lesions."

Dr. W. S. Peters of Brandon described the arrangements which were made for completing the pregnancy survey in Manitoba.

A meeting of the North Western District Medical Society was held at Hamiota on May 11th, 1938.

A paper was read by Dr. F. G. Allison, M.R.C.P. of Winnipeg on "Recent Advances in Cardiology."

Dr. W. S. Peters of Brandon also explained the proposed pregnancy survey for Manitoba, which is to be conducted under the auspices of the Department of Health of Manitoba, the Department of Health of the Dominion, the Rockefeller Foundation and the Manitoba Medical Association.

#### MANITOBA SANATARIUM DATES OF TRAVELLING CLINICS FOR JUNE

Carman clinic .....	Thursday, June 2nd Friday, June 3rd
Treherne clinic .....	Saturday, June 4th
Brandon monthly clinic .....	Tuesday, June 14th
Dauphin monthly clinic .....	Wednesday, June 15th

The Canadian Medical Association meets this year in Halifax, June 21st, 22nd, 23rd and 24th. A very attractive program has been drawn up and visiting members will find both in the general sessions and in the branch and specialty meetings, presentations by many of the outstanding men of the continent. A full four days of entertainment has been planned for the ladies, junior guests and the men who come for relaxation as well as scientific gain. There will be dinners and dances, golf, yachting, picnics, scenic drives and the many other attractions which go to make up the beauty of Halifax in June. Reservations, at the hotels, are already pouring in and it would be wise to plan, now, on coming with your family.

Dr. J. N. Hutchinson, Toronto General Trusts Building, has retired after forty-three years of practice. This practice has been taken over by Dr. J. H. Skaling, formerly of Saskatoon.

# Indications for Use of Perfringens (Gas Gangrene) Antitoxin

Use of Perfringens (Gas Gangrene) Antitoxin is indicated in treatment of infections caused by *B. perfringens* (*B. welchii*). In the case of certain contused and puncture wounds such as gunshot wounds, danger of infection with *B. perfringens* is great and administration of Perfringens Antitoxin as a prophylactic is recommended. Where gas gangrene is feared or has developed as a sequela of such infections, prompt administration of large amounts of this antitoxin has been proved of definite value. Clinical observations have shown the value of this antitoxin both before and after abdominal surgery in cases subject to toxæmia due to severe peritonitis or acute intestinal obstruction. The value of the antitoxin has also been demonstrated in treatment of gas gangrene occurring with puerperal sepsis following abortion.



*Information and prices relating to Perfringens (Gas Gangrene) Antitoxin  
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will be supplied gladly upon request.*

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## Department of Health and Public Welfare

### NEWS ITEMS

The following article is one published by Doctors J. Burns Amberton, Jr., and William E. Studdiford in a recent edition of "Preventive Medicine," and is one which the Department believe will prove of real interest to the practising profession of Manitoba:

**Pregnancy in the Tuberculous Woman:** In any consideration of the tuberculous woman who becomes pregnant or who contemplates pregnancy, thought must be directed primarily to the disease from which she suffers. This must be done, however, without slighting the pregnancy which may be merely prospective or an actuality. In most instances the presumption or proof is present that this disease antedated pregnancy. While the first symptomatic manifestations may arise during pregnancy, they may have little or no relation to the real inception of the disease. The occurrence of acute symptoms of tuberculosis during the pregnant state often gives rise to the question of activation during, and therefore, on account of the pregnancy. To what extent this hazard exists, how and when it operates, how it may be recognized and anticipated, how it may be alleviated or avoided are questions of great importance to the woman.

"One may make the primary assumption that, under certain circumstances, there is a real and serious hazard. Nothing so mathematical as statistics is quoted to support this view; only the interpretation of certain observed events is presented. Most of the reports dealing with this situation share somewhat in the same conclusion, whether or not they rely heavily on the statistical approach. In fact, most agree that statistical analyses point only to very general trends and that, at best, they can serve as a background for thinking in specific situations. The variable factors entering into each of the two conditions, pregnancy and tuberculosis, are much too numerous for mathematical evaluation, and this undoubtedly accounts for some of the opposing deductions drawn from such studies. Increasing knowledge of the behaviour of tuberculosis has altered the picture so radically that the older statistics, in perspective, have become merely historic landmarks. Recent ones, to be of value, must be correlated with other kinds of information in order reasonably to support judgments which the physician must render in individual cases.

"It is necessary from the outset to recognize certain variable factors in human tuberculosis. We are primarily interested, of course, in the lesions of the lungs which constitute a real or potential menace to life and health; not so much in the small scars which are present in most lungs and which seldom do harm. A coincidence of great significance is the sharp and high rise in the occurrence of serious and fatal tuberculosis in females during adolescence and early adult life. It is the most fatal of all diseases when fertility is at its height. However, not only must age and sex be considered, but also the type and quality of the tuberculosis. While pathologists long ago distinguished between the pneumonic and fibroid forms, it is only in recent decades that the clinician has learned the vital importance of these different tissue reactions against the tubercle bacillus. Understanding and appreciation of them have a marked bearing on our problem. Often this is of more importance than the mere extent of the disease which is usually designated as minimal, moderately advanced or far advanced. While any of the tissue reactions may occur regardless of age, the productive or fibroid reactions predominate

in persons past middle life, and the exudative or pneumonic reactions characterize most of the significant lesions in young people. The latter type of reaction is especially apt to occur in adolescent females.

"The significance of these differences deserves emphasis. It may be expressed in the potential power of the small lesion to progress and to propagate extensive and serious ones. It is now recognized that this occurs chiefly by direct extension at the periphery of the lesion, and by liquefaction necrosis, ulceration into the bronchial tubes, and spilling of the infectious discharge through these channels into healthy parts of the lungs. Further, with coughing and swallowing, infection often is carried to the larynx and intestine, to set up there the two most common complications of phthisis. The mechanism of spread is the same regardless of the type of reaction but the tendency to spread differs. In contrast with the productive lesion, the exudative tends more often and more rapidly to expand by inflammatory reaction at its periphery, to caseate and undergo liquefaction at its center, and, when it ulcerates, to liberate more copious discharges laden with a greater concentration of tubercle bacilli. These differences go far to explain the prevalence of labile, potentially dangerous, and fatal forms of tuberculosis in women of the child bearing age.

"As described, the lability of a lesion depends on its intrinsic character. This is only true in part since it also depends on fluctuation in other favorable or unfavorable influences usually spoken of as manifestations of resistance or susceptibility. Advancing age, alone, seems to be a favorable influence in women. In addition, the positive value of proper environment, good nutrition, adequate physical, mental, and emotional rest are well known. On the other side may be recognized damaging factors, such as uncontrolled diabetes mellitus, overstrain of any sort, and low economic level with all its attendant deprivations, especially malnutrition. The varying balance is illustrated by the fact that excessive exposure of the body to the sun may stimulate a fresh exudative pulmonary lesion unfavorably, while a properly measured exposure may benefit the patient with an old fibroid lesion. Similarly the injection of tuberculin may help or hinder.

"Among the influences one must consider in females is that of menstruation. Well localized productive lesions in the lungs are seldom affected but young women with pneumonic or poorly encapsulated lesions sometimes experience fever and hemoptysis, and may suffer extension of the tuberculosis before or during the menses. It is difficult or impossible to identify the mechanism by which these influences work. One basis for this effect, which has been studied by Petersen and Levinson, is varying capillary permeability. This is a general phenomenon, having a definite local relationship in pulmonary tuberculosis since absorption of toxic products from the morbid lesions, and perhaps extension of the lesions themselves, are favored by increased capillary permeability. This may possibly be the chief mechanism through which the harmful influence of menstruation operates.

"Always it should be remembered that several mechanisms come into play for or against the welfare of the patient. Menstruation is harmful for the tuberculous usually because other factors are none too helpful. It is not just intuition but actual observation in many cases which enables us to sense a convergence and alliance of evil influences which may be pathological, physiological, constitutional, racial, social and other. All of them serve to lower the barriers upon which we rely to hold the disease in check.

"It is only in this way that the influences of preg-

\* From the Tuberculosis Service First Medical (Columbia University Division), and the Obstetrical and Gynecological Service Third Surgical (New York University) Division, Bellevue Hospital.

nancy upon the tuberculous women can be conceived. Profound as they are, there is no one factor in the metabolic, endocrine, circulatory, or mechanical changes of pregnancy which has been clearly defined as acting surely and constantly for the benefit or the detriment of the tuberculous woman. Some women with indolent, productive lesions experience improvement during and after pregnancy. Could all the beneficial factors be recognized, they might include improved appetite, digestion and assimilation, altered endocrine balance with the usual increase in thyroid activity, a changed mental outlook, and others. Some observers would go so far as to include the propping up of the diaphragm by the gravid uterus, thus resting the affected lungs. Likewise there may be something in the pregnant state such as altered vascular tone or changed capillary permeability which is sufficient to set up an unfavorable reaction in a fresh and very labile pulmonary lesion. Aiding and abetting this factor may be others such as excessive vomiting, malnutrition and constitutional inferiority. Furthermore, while it is important to identify the effects of pregnancy as such, one cannot in clinical practice exclude from consideration the effects produced by labor. Parturition may result in little strain on the mother. On the other hand it may be prolonged, exhausting, and associated with blood loss, trauma, and acute infection. The responsibilities of the puerperium and of motherhood, especially under adverse economic circumstances, may be the principal deleterious factor. Since tuberculosis is a chronic disease which usually is something to bargain with throughout remaining life, it is necessary to consider continuing and remote consequences if one is to estimate the effect of a given event. Only with this attitude is one able to give a fair estimate of the significance of pregnancy for the tuberculous woman.

"The clearest approach is first to consider in general what tuberculous women one would choose or reject for pregnancy and motherhood. Certainly there is no reason to reject women who bear in their lungs the scars of an obviously old and strictly localized lesion. When it comes to situations of clinical importance, the prime choice would be the woman who has had her tuberculosis diagnosed at an early stage, who has healed these lesions under sanatorium treatment, who has remained well for at least two years after the disease was apparently arrested, who has a good constitution and who is able to live under good or excellent circumstances. Other conditions being equal, women with moderately advanced or, occasionally, with fairly extensive bilateral lesions might be permitted to undertake pregnancy. In the latter type of case it should be understood that the lesions must be very definitely of a productive, well healed character and that the woman should have been active and well for two to five years. Women in whom tuberculosis has been well controlled with artificial pneumothorax treatment, as a rule, for a period of over two years from the beginning of this procedure, may often be allowed to go through pregnancy while the lung is still collapsed. It has been the practice at Bellevue Hospital to reduce the pneumothorax during labor and to continue collapse therapy in the postpartum period. It is even possible to allow a pregnancy in a woman who has had a complete resection of the ribs on one side to bring about collapse and healing of a diseased lung, but the preceding interval of good health should be at least five years. Two patients with this type of thoracoplasty have been observed during pregnancy. Both had been well for five years following their operation. One, at about the thirty-sixth week of pregnancy, developed acute appendicitis and peritonitis. She was delivered by Cesarean section followed by hysterectomy, appendectomy and drainage. She recovered and both mother and child are now well. The second case developed marked dyspnea and a rapid pulse in the last two weeks of pregnancy. Because of this respiratory embarrassment she was delivered by Cesarean section. She made an uneventful recovery

and at present appears to be in good health. Her child is flourishing. In short no woman should undertake pregnancy until the pulmonary tuberculosis has been arrested for sufficient time reasonably to assure its stability with a wide margin of safety. If this condition is satisfied pregnancy is seldom a hazard.

"On the other hand, a young woman, who on x-ray examination is found to have a small patch of tuberculous broncho-pneumonia, is in potential danger even though the lesion is causing no obvious symptoms and gives rise to no abnormal signs. Observation, sometimes with sanatorium treatment, over a period of one to two years is necessary before one can say that this is a stable lesion and that pregnancy is not a liability. It is rare to discover such a condition for the first time early in pregnancy except in the course of routine examination including x-ray of the chest. In a considerable series of x-ray examinations of antepartum patients at Bellevue Hospital no such lesion was found. Pregnancy, of course, should not be permitted in the group of cases described in the preceding paragraph until the prescribed period of observation has been completed. Unless the patient is unalterably opposed to intervention, pregnancies occurring in such individuals should be interrupted. The method of choice is by dilatation and curettage before the tenth to twelfth week. This method is most certain and, when properly performed, is free from complications. Care must be used in selecting anesthetics, avoiding those which irritate the lungs. Nitrous oxide or cyclopropane, when available, seem to be the best agents. Pre-operative medication with morphine and scopolamine or with the barbituric acid derivatives is of advantage. Induction of abortion by x-ray, while theoretically less dangerous, is less certain than curettage in its results and more liable to complications.

"The problem is, of course, more involved when the woman is first discovered to have tuberculosis after her pregnancy has advanced beyond the first trimester. If the pulmonary lesions appear old and well healed, they should be closely watched but, as a rule, they do not warrant any fear as to the outcome. In other patients in whom the tuberculosis is judged to be obviously or potentially menacing and in whom the pregnancy has passed the third or fourth month, the woman usually tolerates completion of the pregnancy as well as she will the more extensive operative procedures necessary to bring it to an end. Furthermore, the patient has reached the stage in which it is least likely that the pregnancy will act as an unfavorable influence. Such patients with exudative or caseous pulmonary lesions obviously are in danger from tuberculosis alone. Pregnancy can be regarded as an added liability, the seriousness of which must be estimated in the light of many other factors, including the constitutional and social. Most difficult to judge is the relatively limited lesion of doubtful status. In some cases it is impossible at once to determine whether this is a receding healing lesion or the opposite. Since the degree of danger is not clear, a period of close observation is necessary to determine the point. Should such a lesion become progressive at or after the middle of pregnancy, artificial pneumothorax may be induced but this recourse should not be regarded as the most desirable means of control during gestation. Any woman with active or potentially active tuberculosis who elects to continue pregnancy should be treated in a sanatorium or at least under sanatorium conditions.

"One may summarize the special care of such individuals by the following statement. The status of all tuberculous patients who contemplate pregnancy or who are actually pregnant should be determined by an experienced internist. It must be emphasized that many patients without fever suffer from progressive tuberculosis. Other criteria including serial x-ray examinations, sputum examinations, and blood cell counts must be satisfied to estimate the situation accurately. This is particularly true of the small exudative lesion in the young woman who as yet has

had no symptoms at all. On the basis of this examination, one may decide whether the individual is fit to undertake or to continue a pregnancy.

"Many tuberculous women may be allowed to undertake or to continue pregnancy. Some come under observation when pregnancy has advanced to such a stage that intervention is no longer a simple procedure, and for this reason are allowed to continue to term. In addition to the usual details of antepartum care, careful attention should be paid to the pulmonary condition. This necessitates observation by both the internist and the obstetrician. Should no complications arise, the most important point to consider from the obstetrical point of view is the method to be employed in delivering the patient. On the surface Cesarean section would seem to obviate the strain of labor, with its attendant dangers of uterine hemorrhage and infection. On the other hand Cesarean section cannot be performed without risk and a proportion of cases treated in this manner have a rather stormy postpartum course. When the latter condition arises, the strain on the patient is not to be compared to that which is experienced by the woman who has passed through a short easy labor. It has been our policy not to decide on the method of delivery until the patient is at term or in the early stages of labor unless clear indications are present for the performance of Cesarean section. If, at term, no fetal disproportion is present and if the degree of dilatation and retraction of the cervix indicates a relatively short labor, nature is allowed to take its course. The second stage is shortened by the use of forceps to avoid the additional strain at this time. Nitrous oxide or cyclopropane are the usual anesthetics employed. If, on the other hand, at the onset of labor a hard resistant and unretracted cervix is present, Cesarean section is employed to avoid the protracted labor which almost always follows under these conditions. Finally it is unwise to allow these patients, when the birth canal is of doubtful dimensions, to go through the strain of a trial labor. An exception to this plan of delivery is the patient with healed fibrous lesions of long duration. They can be handled with almost the same latitude as the normal women.

"During the postpartum period such patients should be kept at prolonged bed rest, the status of the tuberculosis alone being the criterion of subsequent management. Except in the healed chronic case, it is unwise to permit the mother to nurse the infant because of the added drain on her resources. Furthermore, nursing should never be permitted unless slide examinations and guinea pig inoculation has proven the sputum of the mother to be free from tubercle bacilli. The newborn infant is extremely susceptible to tuberculosis. Placental transmission is rare and most cases of infantile tuberculosis are acquired from carriers in contact. Obviously the infant of a mother with active tuberculosis should be isolated from her and placed in an environment where it will be free from the danger of infection.

"Finally one must remember that the new mother undertakes a difficult, arduous and full time occupation, if she undertakes the full time care of a young infant. When possible, it is of advantage to the tuberculous patient to lift as much of this responsibility as possible from her shoulders."

#### SUMMARY

1. The mere finding of a tuberculous lesion in the chest does not warrant the conclusion that pregnancy is hazardous.
2. The significance of the situation must be estimated first according to all the criteria which are used to forecast the potentialities of the tuberculosis alone, and second according to the modifications of these by pregnancy and its consequences.
3. Such an estimation now rests on rather solid ground and determines with reasonable accuracy

the probable effect of the pregnancy on the tuberculous woman.

4. In unfavorable cases, if the pregnancy is discovered before the tenth to twelfth week, pregnancy may be terminated by therapeutic abortion. Proper attention should be paid to anesthetic agents.
5. In unfavorable cases, if the pregnancy is found to have advanced much beyond the tenth to twelfth week, more extensive operative procedures are required to terminate the pregnancy. Because of this such cases are permitted to complete the course of pregnancy.
6. Modern therapy with the employment of strict bed rest and of artificial aids such as pneumothorax, should be utilized whenever indicated.
7. The method of delivery should be decided at term or early in labor when the probable duration and risks of normal parturition can be most accurately estimated. A normal short first stage with shortening of the second stage by means of forceps is the safest type of labor. However, the indications for Cesarean section should be definitely broadened in this group. Proper attention should be paid to anesthetic agents.
8. Prolonged rest postpartum is important. Proper supervision and assistance should be given to the mother after discharge.
9. Measures should be taken, when indicated, to prevent the infant from acquiring tuberculosis.
10. The ideal is to detect tuberculosis by proper case finding methods before the women become pregnant and then to allow pregnancy only after the tuberculosis is definitely and well controlled. It would be advantageous if chest roentgenograms could be made for the women in the first month of every pregnancy in order to rule out the presence of a serious pulmonary lesion. This procedure would guard against an uncontrollable situation with respect to this serious disease.

#### COMMUNICABLE DISEASES REPORTED Urban and Rural - April, 1938.

**Mumps:** Total 458—Brandon 249, Winnipeg 122, St. James 8, St. Vital 8, Kildonan East 6, Argyle 1, Arthur 1, Ethelbert 2, Hanover 1, The Pas 1, Elton 1, Virden 1, Whitehead 1 (Late Reported: March, Brandon 46, St. Vital 5, St. James 3, Ethelbert 1, Unorganized 1).

**Chickenpox:** Total 262—Winnipeg 224, Kildonan West 15, St. Andrews 6, Kildonan North 4, St. Boniface 3, Gilbert Plains Rural 1, St. James 1 (Late Reported: March, Kildonan West 6, Kildonan East 1, Lorne 1).

**Scarlet Fever:** Total 107—Unorganized 26, Winnipeg 14, Gladstone 9, Brandon 7, Macdonald 6, Thompson 6, Westbourne 6, Whitehead 6, Riverside 5, Assiniboia 2, Brokenhead 2, Springfield 2, Argyle 1, Boulton 1, Hanover 1, Pipestone 1, Portage City 1, Sifton 1, Stonewall 1, St. Clements 1, St. Francois Xavier 1, St. Vital 1, Whitemouth 1 (Late Reported: February, Grey 1; March, Pipestone 3, Brandon 1).

**Whooping Cough:** Total 79—Brandon 36, Cypress North 13, Winnipeg 6, St. Vital 5, Flin Flon 4, Unorganized 3, Rockwood 2, Kildonan West 1, Shell River 1, Transcona 1, Whitemouth 1 (Late Reported: March, Brandon 4, Flin Flon 1, St. Boniface 1).

**Tuberculosis:** Total 43—Winnipeg 9, Brandon 2, Flin Flon 2, Rosburn Rural 2, Portage City 2, Unorganized 2, Armstrong 1, Bifrost 1, Cartier 1, Clanwilliam 1, Cypress North 1, Dauphin Town 1, Ellice 1, Fort Garry 1, Hanover 1, Lorne 1, Minnedosa 1, Montcalm 1, Norfolk North 1, Oakland 1, Pembina 1, Pipestone 1, Portage Rural 1, Rhineland 1, Rockwood 1, Rosedale 1, Springfield 1, Strathclair 1, St. Laurent 1, Tache 1.

**Measles:** Total 16—Unorganized 11, Winnipeg 2, Macdonald 1, Portage City 1, Louise 1.

**Influenza:** Total 14—Winnipeg 1 (Late Reported: February, Montcalm 2, Brandon 1, Brokenhead 1, Clanwilliam 1, Coldwell 1, Lansdowne 1, Lorne 1, Minto 1, Pipestone 1, Rhineland 1, St. Boniface 1, The Pas 1).

**Diphtheria:** Total 12—Winnipeg 5, Montcalm 2, Brooklands 1, Franklin 1, St. Boniface 1, Tache 1, Winkler 1.

**Erysipelas:** Total 5—Winnipeg 2, St. Andrews 1 (Late Reported: February, Swan River Town 1; March, Selkirk 1).

**Typhoid Fever:** Total 3, Hanover 1, Turtle Mountain 1, Winnipeg 1.

**Undulant Fever:** Total 3—Rockwood 1, Winnipeg 1, (Late Reported: January, Rockwood 1).

**Anterior Poliomyelitis:** Total 1—St. Laurent 1.

**Cerebrospinal Meningitis:** Total 1—Unorganized 1.

**Septic Sore Throat:** Total 1—Brandon 1.

**Venereal Diseases Reported:** Total 99—Gonorrhoea 61, Syphilis 38.

#### DEATHS FROM ALL CAUSES IN MANITOBA For the Month of March, 1938.

**URBAN**—Cancer 34, Pneumonia 13, Tuberculosis 10, Influenza 3, Syphilis 2, Cerebrospinal Meningitis 1, Chickenpox 1, Infantile Paralysis 1, Puerperal Septicaemia 1, Erysipelas 1, all others under 1 year 13, all other causes 156, Stillbirths 9. Total 245.

**RURAL**—Pneumonia 23, Cancer 18, Influenza 13, Tuberculosis 13, Whooping Cough 2, Lethargic

Encephalitis 1, Measles 1, Scarlet Fever 1, Syphilis 1, all others under 1 year 18, all other causes 142, Stillbirths 17. Total 250.

**INDIAN**—Pneumonia 8, Tuberculosis 6, Diphtheria 1, Influenza 1, Syphilis 1, all others under 1 year 10, all other causes 8, Stillbirths 1. Total 36.

## Medical Library University of Manitoba

### Current Medical Literature

#### "British Medical Journal"—April 2, 1938.

"The Alkaloid Ephedrine," by J. H. Gaddum, Sc.D., M.R.C.S., L.R.C.P., Professor of Pharmacology, University College, London.

"Amenorrhoea: Its Aetiology and Treatment," by T. N. MacGregor, M.D., F.R.C.S. (Ed.), M.C.O.G., Assistant Gynaecologist, Deaconess Hospital, Edinburgh; Late Tutor in Clinical Gynaecology, Royal Infirmary, Edinburgh; Crichton Research Scholar.

"Rate of Sedimentation of Red Blood Cells as a Clinical Test in General Practice," by E. Scott, B.A., D.M., B.Ch.

"The Female Climacteric and The Menopause," by H. R. Donald, M.A., B.M., M.R.C.P., Honorary Physician, Manchester Northern Hospital, Stretford Memorial Hospital, and Royal Eye Hospital; Visiting Physician, Crumpsall Hospital.

"Physical Education," by Viscount Dawson of Penn., M.D., P.R.C.P.

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**"British Medical Journal"—April 9, 1938.**

"The Interaction of Pregnancy and Associated Disease," by R. W. Johnstone, C.B.E., M.D., F.R.C.S. (Ed.), F.C.O.G., Professor of Midwifery and Diseases of Women, University of Edinburgh.

"Calcium and Phosphorus Deficiencies in a Poor Human Dietary," by William E. Gaunt, B.Sc., Ph.D., James T. Irving, M.A., M.D., Ph.D., and William Thomson. (From the Rowett Research Institute, Aberdeen).

"Fracture of the Neck of the Femur," by H. A. Brittain, M.Ch., F.R.C.S., Orthopaedic Surgeon, Norfolk and Norwich Hospital.

"Malignant Tumour of the Thymus Gland," by R. G. Prosser Evans, M.R.C.S., Late Senior House-Physician, Brompton Hospital Sanatorium; Acting Tuberculosis Physician (Swansea), Welsh National Memorial Association.

"Extra-Uterine Gestation: Live Child," by Frank Stabler, M.D., F.R.C.S., M.C.O.G., Honorary Assistant Obstetrician, Princess Mary Maternity Hospital, Newcastle-upon-Tyne.

"Spontaneous Haemopneumothorax," by James Maxwell, M.D., F.R.C.P., Assistant Physician, St. Bartholomew's Hospital; Physician, Royal Chest Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth.

**"British Medical Journal"—April 16, 1938.**

"On the Origin of Cancer," by W. Cramer, Ph.D., D.Sc., M.R.C.S., L.R.C.P. (From the Imperial Cancer Research Fund).

"The Alleged Effect of Acetylcholine on Immobilized Joints," by A. M. Harvey, M.D., Baltimore. (From the National Institution for Medical Research, Hampstead, London).

"Glasgow Experience of Increased Dysentery Prevalence," by E. Bloch, M.A., M.B., Ch.B., D.P.H., Public Health Department, Glasgow.

"Carcinoma of the Palate: How Often Does it Mask Malignant Disease in the Maxillary Antrum?" by John R. Nuttall, M.D., D.M.R., National Radium Officer, Manchester Centre; Assistant Medical Officer, Christie Hospital and Holt Radium Institute.

"Tinea of the Foot," by P. K. Fraser, M.D., Ch.B., Surgeon Lieutenant, R.N.

"Ante-Natal Care and Some Complications of Labor," by D. J. MacRae, M.B., F.R.C.S., Ed., M.C.O.G., Obstetric Registrar, St. Mary's Hospital.

**"The Journal of Obstetrics and Gynaecology of the British Empire"—February, 1938.**

"Menstruation-like Haemorrhage in Rabbits Induced by Gonadotropic Hormone. Is there a Third Hormone in the Ovary Which Causes Bleeding?" by Professor Bernhard Zondek, M.D., Jerusalem, Palestine. (From the Gynaecological-Obstetrical Department of the Rothschild-Hadassah Hospital, Jerusalem).

"The Effect of Progesterone on the Metaplasia of the Uterine Epithelium of Rats Injected with Oestrogens," by V. Korenchevsky, M.D., and K. Hall, Ph.D. (From the Lister Institute, London).

"The Intra-Abdominal Pressure in Pregnancy Newly Considered," by R. H. Paramore, F.R.C.S. (Eng.).

"Oedema in Pregnancy," by W. C. W. Nixon, M.D. (Lond.), F.R.C.S. (Eng.), M.C.O.G., Professor of Obstetrics and Gynaecology, University of Hong Kong.

"Four Cases of General Peritonitis Following Childbirth; Operation; Recovery," by R. Rutherford, F.R.C.S.

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